

Amendments to the Specification:

Please amended the Sepcification as follows. A Substitute Specification in clean form is attached hereto.

~~COMPUTER IMPLEMENTED METHOD PROVIDING SOFTWARE VIRUS INFECTION
INFORMATION IN REAL TIME~~

TITLE OF THE INVENTION

~~Field of the invention~~

[0001] Computer Implemented Method Providing Software Virus Infection Information In Real Time

BACKGROUND OF THE INVENTION

[0002] The present invention relates generally to the field of data processing systems and data communications for personal computers (PCs) and in particular to a computer implemented method intended to provide in real time and using a communication network, in particular a global one, such as the Internet, computer infection information to multiple users with regard to computer or software viruses extend or spread on a particular geographical area (location and time) and also about the trend of expansion of a virus or viruses helping ~~in this way in alerting~~ said to alert users in order to better cope with detected viral programs.

[0003] The method according to this invention provides information about real risk that users placed at different locations and connected through a communication ~~network~~ network, face of being infected by a computer virus and the resulting damage it can cause at any given moment, at any of said different locations. In particular and according to a preferred ~~embodiment~~ embodiment, the method allows any computer user to see the virus infection status in any region, country, and continent or even across the whole world at ~~[[a]]~~ first sight or for example just by selecting a geographical area such as a country from a drop-down menu.

[0004] ~~Therefore~~ Therefore, this method while providing a real-time monitoring of computer virus activity in a region and in general across the globe, will aid computer users, through the given information and special warnings provided, to cope at any moment with any computer virus situation and ~~avoiding that they~~ to avoid unknowingly and innocently contribute to spread computer viruses.

Background of the invention

[0005] Since the 1990s, viruses have become a serious problem. Many nasty viruses do irreversible damage, like deleting some or all of the user's files. The Internet is quickly becoming the preferred data communications medium for a broad class of computer users ranging from private individuals to large corporations. Such users now routinely employ the Internet to access information, distribute information, correspond electronically, and even conduct personal conferencing. An ever-growing number of individuals, organizations and business have established a presence on the Internet through "Web pages" on the World-Wide-Web. ~~It has to be remarked that nowadays~~ Nowadays, millions of computers are interconnected through the Internet, which has become a real global network.

[0006] As the popularity of the Internet has grown, so too have concerns about breaches in system security, such as computer or software viruses, which may be introduced by data downloaded from the largely-unregulated network. Existing virus scanning utilities typically are installed on end-user systems, but this approach ~~presents presents~~, in some ~~eases cases~~, potential problems. ~~Firstly~~ Firstly, if the virus scan utility is not regularly updated, infected files may still reach a user's system, for example, downloaded from a network or copied from an external storage device without the user's knowledge. The infected data may reside undetected on the user's system for a long period of time, for example, until the next time the user updates his/her ~~antivirus~~ anti-virus software and does a complete system scan, which many users do no more frequently than weekly, if at all. In the meantime, the user may inadvertently pass the infected file to other users. In addition, users may forget to leave virus checking software running, thereby providing infected data with an opportunity to infiltrate their system, and also the virus checking or anti-virus software used may be outdated, ~~that is~~ i.e., lacking the latest known virus pattern files.

[0007] It is known to provide anti computer virus programs that apply tests for a large number of known virus types and characteristics. If a computer virus is detected, then a warning is issued to the user and the user is given the option to delete, quarantine or clean the infected file.

[0008] US 2002/0103783 discloses ~~[[a]]~~ decentralized virus scanning for stored data, such as for example in a networked environment to cope with problems unique to specialized computing devices such as servers, providing protection at the source of the files.

[0009] US 2002/0116639 propose a method and apparatus for providing a business service for the detection, notification and elimination of computer viruses for handling a virus in a large network of data processing systems or machines. According to this ~~method~~ method, in response to detecting a virus infection, a virus scanner and notifier (VSN) residing on a client data processing system sends notification of the presence of a virus to a software module residing at a remote server through a communication link. Said server may then execute an action based on a business policy in response to receiving the notification.

[0010] US 2002/0138760 describes ~~[[a]]~~ computer virus infection information providing a method for detecting a computer virus in information transmitted between a terminal apparatus and a central apparatus and making ~~available~~ available, from ~~said the~~ central apparatus that stores the communication history of the information transmitted by terminal ~~apparatuses~~ apparatuses, infection information such as the time of infection to the ~~users~~ users, and thereby permitting the users to understand the time of infection easily.

[0011] US 2002/0147915 discloses a ~~method~~ computer program product and method and network data processing system for the detection, notification and elimination of certain computer viruses on a network using a promiscuous system as bait.

[0012] The present invention proposes a new strategy not disclosed in previous proposals, such as the above mentioned prior art, providing to a computer user in real time and in an automatic way information about the existence of active viruses in any particular area where said user operates or intends to operate. The information so made available, in general to any user, is obtained by collecting information about the results of at least a virus detection operation carried out on a ~~big amount~~ large number of computers spread out among several different locations, processing the reports issued and allocating then the detected computer viruses in geographical areas.

[0013] The proposed invention also provides information ~~available~~ available, in general to any computer user, about the expansion or tendency to spread or expand ~~of said~~ such viruses, their identity or name, detailed information on the ~~viruses~~ virus's behavior, and more risky

computer ~~viruses~~ viruses, ~~i.e.~~ i.e., it constitutes a tool acting as a computer viruses forecast, providing at the same time virus cleaning and file repair tools for the computer viruses.

Summary of the invention

BRIEF SUMMARY OF THE INVENTION

[0014] This invention ~~refers~~ is directed to a method prepared to offer automatic information of both a threat level of a particular computer virus and the threat level of the combined action of all computer viruses in circulation in a particular geographical area ~~[[e]]~~ or region acting on PCs (~~server servers and/or work station stations~~), ~~i.e.~~ i.e., the combined result of the threat levels of each active computer virus in said area which can be described as a computer “virus ~~climate~~”-climate.”

[0015] The proposed method ~~provides~~ provides, in ~~fact~~ fact, information ~~allowing knowing~~ about the probability of a user being affected by a computer virus in a specific area, at any given time, due to the extent of viruses or properties of them (e.g., particular activity, threat level, etc.).

[0016] The importance of knowing the cited computer “virus climate” can be compared to weather reports that help to make decisions before going on a journey. This report should outline the probability of being affected by ~~[[a]]~~ computer virus attacks, what type of damage can result (a link to a virus information center capable to provide a help or assistance is also given) and practical information on how to stay safe.

[0017] Although computer viruses are a global phenomenon, the inventors have realized that sometimes certain computer viruses hit some regions harder than others. For this ~~reason~~ reason, the results, *i.e.*, the given information, of the proposed method always correspond to selected geographic regions: states, countries, regions, continents or even the whole world.

[0018] Not all the computer viruses pose the same threat to users. Each virus presents a high or low-level threat at any given ~~moment~~ moment, and for this reason according to this ~~invention~~ invention, an index has been created to measure a computer virus threat level. A special feature of the proposed invention is that a value on said index is specific for each computer virus and it is updated in real-time as the virus spreads or the threat recedes: If a virus is spreading rapidly or its capacity to damage systems is high it represents a greater threat and vice versa.

[0019] The method of this invention comprises ~~substantially the following steps~~:

- a) providing a computer virus utility program to a plurality of users distributed around different ~~locations~~ locations, each of them operating at least one local computer;
- b) obtaining information about geographical location of each of said local computers from said users or by alternating means;
- c) carrying out, using said computer virus utility program, at least a computer virus search or scanning operation covering at least a part of at least one hard disk of said local computers or at least a part of a unit supporting information connected or connectable to said local computers;
- d) issuing a report containing the results of the search or scanning operation, of any computer virus detected after finishing said at least a computer virus scanning or search operation on at least a part of said local computer and automatically making available the results of said report through a communication network along with at least data of location of said local computer, to a remote center;
- e) processing at said center the plurality of reports received from different local computers and allocating said detected computer viruses in geographical areas; and
- f) making available information about at least the most active computer viruses at a given time in a series of geographical areas enabled to be selected corresponding to said different locations of step a) and about the percentage of infected computers in each of said geographical areas.

[0020] Step f) is periodically updated and the information made available is provided preferably through a local ~~[[e]]~~ or global communication network such as the Internet.

[0021] While to implement the proposed method steps a) to e) need to be carried out, the information made available at step f) can be made accessible to any user (without either execute steps ~~a, b, e~~ a, b, c) on his/her computer) by simply connecting through a communication network to a particular site offering it.

[0022] According to a preferred embodiment, the step of said making available the results of said the report at step d) to a center is done preserving anonymity of the users having executed step c).

[0023] ~~The step~~ Step c) is performed in general in response to a petition of said user to which the features of the method are presented in general through a communication network and from a site such as a Website (Internet).

[0024] Also the step making the results available at step d) is done according to a preferred alternative after prompting a petition to the user of the local computer and obtaining an authorization to send the issued report.

~~Brief description of the drawings~~

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0025] The foregoing summary, as well as the following detailed description of preferred embodiments of the invention, will be better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there are shown in the drawings embodiments which are presently preferred. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown.

[0026] In the drawings:

[0027] Fig. 1 attached to this specification provides a basic diagram of a global implementation of the proposed ~~method~~ method;

[0028] Fig. 2 shows a schematic representation of the exposed status of virus infection ~~risk~~ risk;

[0029] Fig. 3 shows a map indicating the level of infection in different parts of the ~~world~~ world; and

[0030] Fig. 4 is an alert panel according to one embodiment of this invention showing the level of infection at a global or local level according to a color representation indicative of the level of infection.

~~Detailed description~~

DETAILED DESCRIPTION OF THE INVENTION

[0031] The method of this invention comprises substantially performing steps a) to f) previously detailed. As previously stated and according to a preferred ~~embodiment~~ embodiment, any user, once the method has been put into operation (i.e. by several users at many different locations having executed steps a) to e)), can have access to the information of step f) by simply reaching a particular site through a communication network such as the Internet.

[0032] ~~Said~~ The computer virus utility program includes anti-virus software that can reside temporally or permanently in a local computer.

[0033] According to a preferred embodiment, the information provided at the step f) is periodically updated information obtained as a result of the plurality of reports processed at step e). In ~~general~~ general, ~~said the~~ information is renewed and issued as soon as new batches of reports from any particular geographical area are processed by said center at step e).

[0034] ~~Alternatively~~ Alternatively, ~~said the~~ periodically updated information of step f) is renewed each predetermined period of time.

[0035] The process of step e) at ~~said the~~ center includes statistic operations of the data from the plurality of issued reports received.

[0036] In particular, processing operations carried out at step e) will include an evaluation for each of ~~said the~~ geographical areas of the number, name and expansion of detected computer viruses.[-]

[0037] Therefore the information provided at step f) will also include the extent of some of said most active detected computer virus at any given geographical area.

[0038] Additionally this information will preferably include the trend of spread of all of ~~said the~~ most active detected computer virus at any given geographical area, during an immediate preceding period of time, the duration of which will be indicated.

[0039] In a preferred ~~embodiment~~ embodiment, step a) of providing said computer virus utility program is carried out on line, downloading a computer virus utility program from a site of a remote provider which also can be a site providing anti-virus tools to the users.

[0040] Steps a) and b) can be performed sequentially at any given order. If step b) is the ~~first~~ first, an indication about the fact that the requested information about geographical location will provide access or allow obtaining a link to a computer anti-virus service will be given.

[0041] Step c) can include a heuristic exploration of ~~said the~~ local computer in order to detect some files suspected to be infected, the results being also specifically detailed as suspected files in ~~said the~~ issued report.

[0042] According to a preferred embodiment of the ~~invention~~ invention, if any computer virus is detected in ~~the step~~ the step ~~[[e)]]~~ c), a virus cleaning and file repair operation could be performed which can comprise:

eliminating the detected computer virus from an infected file or files;

~~take~~ taking away the adverse effects caused by a virus on the infected computer;
and

~~remove~~ removing an infected file or files from said local computer.

[0043] ~~Optionally~~ Optionally, the infected file or files can be quarantined.

[0044] Furthermore step c) can selectively be performed:

on the whole or on only a part of the hard disk of said local computer;

on an area interchanging messages of said local computer; or

on an external unit supporting information connected or connectable to ~~said~~ the
computer;

on one or more files which can be selected.

[0045] In a preferred implementation of the ~~invention~~ invention, step d) will include prompting a petition to the user of the local computer in order to obtain an authorization to send the issued report before it ~~being~~ is effectively sent through a communication network to ~~said~~ the remote center.

[0046] The issued report of step d) will ~~include~~ include, in ~~general~~ general, the number of times that a detected virus appears in the virus detection operation performed on a local computer at step c).

[0047] ~~Said~~ The report can also include the number and name of the computer ~~virus/es~~
virus(es) found. In addition, the number and kind of infected files can also be reported.

[0048] In step ~~[[d)]]~~ d), in addition to the geographical location of each local computer, information about the time of the virus scanning operation or performed report is issued.

~~Alternatively~~ Alternatively, ~~said~~ the report obtained in step d) can further include the time at which ~~said~~ the report is sent to ~~said~~ the center.

[0049] As an option, information about the computer operating system of ~~said~~ the local computer can also be included in ~~said~~ the issued report of step d).

[0050] The referred plurality of local computers ~~are~~ are, in general, distributed around a wide geographical area including at least two distant regions or States of a country or even all the world if the communication network is a global network such as the Internet.

[0051] ~~However~~ However, the effectiveness of the proposed method will also be apparent when using a particular network such as a large company network covering a plurality of local computers located at different areas (regions or countries). ~~The proposal of this~~ The present

invention clearly differentiates ~~of the~~ over that disclosed in the cited US 2002/0116639, by providing ~~in this case~~ in addition to performing a cleaning ~~an~~ and file repair operation an immediate information about degree of proliferation of a single computer virus or combination of viruses in a particular geographical zone where a user is located, intends to operate or is interested ~~on~~ in operating.

[0052] The referred computer virus utility program, the computer user downloads for example from an Internet site to start the method and which could reside only temporally on ~~said~~ the local computers, is in addition periodically updated including special anti-virus tools to fight against a newly detected computer virus ~~newly detected~~.

[0053] ~~Said~~ The computer virus utility program can include a communication program through which issued reports of step d) are being sent but in general a communication network such as a global (Internet) ~~[[e]]~~ or large local one will be used.

[0054] According to an implemented version, the method of this invention, depicts the referred computer “virus climate” in the form of color-coded warning conditions in a way similar to that used by emergency services with respect to natural disaster warnings

[0055] According to a preferred embodiment the following warning conditions and indicative colors can be used:

WARNING CONDITION	DEFINITION	PREVENTIVE MEASURES
Green (normal)	Normal status No indication about any virus or hoax constituting a threat exists Low risk of being infected by a computer virus or malicious code,	Apply current preventive measures (anti-virus installed, updated and properly functioning). Be sure that all the computers in use are provided with a fully updated anti-virus.
Orange (pre-alert situation)	Pre-alert status There are indications of the potential of some virus becoming epidemic. High risk of being infected by a computer virus or malicious code.	In addition to the precautions taken under the “green” warning condition, apply specific preventive measures for the most active computer viruses at the time. In case of an administrator, plan an emergency strategy against the most virulent malicious codes in circulation or spread viruses.
Red (alert)	Red alert status At least one severe threat computer virus or (hoax) or two high threat computer viruses are in circulation causing an epidemic.	In addition to the previous precautionary measures mentioned, apply specific security measures against the severe threat and high threat computer viruses that are

	High risk of being infected by a computer virus or malicious code	active (content filters, installation of the corresponding security patches, etc.)
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[0056] Fig 2 shows a schematic representation of the exposed status of virus infection risk, calculated by statistic operations carried out on the data from the plurality of issued reports and processed at step e).

[0057] Fig. 4 shows an alert panel indicating the level of infection at a global or local level according to ~~said~~ the indicative color representation and including a time reference and alternatively (while not represented) the name of a local area.

[0058] It has to be highlighted that each particular situation especially an amber or red warning condition will require specific measures for optimum protection depending of the kind of computer virus or malicious code involved.

[0059] The above indications about the status of computer virus infection risk will in general be accompanied by additional information, clearly explaining the threat level of the computer virus warning condition.

[0060] The additional information may include the following:

region or geographical area to which the warning applies: world-wide, continent, country ~~[[e]]~~ or state/region;

explanation of the severity of the warning condition: for example, when the warning condition is red, one or more computer viruses classified as high threat or severe threat are in circulation and publication of their names, the threat level and the type of systems infected is given; and

specific recommendations through message boards directed on how to deal with a specific computer virus or viruses in particular how to remove it or them or how to handle a situation, as well as special ~~alerts~~ alerts.

[0061] The information about degree of proliferation of a single computer virus ~~[[e]]~~ or viruses, or the combination of viruses in a geographical zone can be obtained by selecting ~~said~~ the zone from a list. The proportion of infected ~~PC~~ PCs and an indication about the trend of spread of the computer virus or viruses is provided by the method.

[0062] According to the ~~invention~~ invention, the cited information about degree of proliferation of a single computer virus or viruses, or the combination of viruses in a

geographical zone can additionally or alternatively be obtained in the form of a map that provides the following information:

- top viruses: list of the most active computer viruses in a region;
- top countries: list of the areas most-affected by a single or all computer virus; and
- proliferation of infection graph: displays the development of PCs infected by a computer virus or all viruses, in each area from the last 24 hours to the past 12 months.

[0063] Usually the map (see Fig. 3) will open as a world map, displaying continents and indicating the level of infection using different color codes. If a user ~~click~~ clicks on a continent, the map will display an expanded version, with each country colored according to its current computer virus status, and a single country can also be selected obtaining more detailed information.

[0064] In addition the cited map offers two options. The first of ~~these~~ these, region, allows selecting the geographic area of interest by simply clicking the desired area. The second ~~option~~ option, by infection, allow choosing the name of virus or hoax causing an infection displaying the geographic area infected.

[0065] This virus map provides a live graphic coverage of the impact of computer viruses in diverse geographic regions.

[0066] On the other side, by the panel represented in Fig. 4 one can obtain at a first sight quick information about the degree of infection at a global or local level, which can be of help to adopt necessary protective measures.

[0067] It will be appreciated by those skilled in the art that changes could be made to the embodiments described above without departing from the broad inventive concept thereof. It is understood, therefore, that this invention is not limited to the particular embodiments disclosed, but it is intended to cover modifications within the spirit and scope of the present invention as defined by the appended claims.

ABSTRACT OF THE DISCLOSURE

A computer implemented method providing software viruses infection information in real ~~time~~ time includes:

~~It comprises following steps:~~

- a) providing a computer virus utility program to a plurality of computer users distributed around different ~~locations~~, locations;
- b) obtaining information about geographical location of said ~~computers~~, computers;
- c) looking for viruses by searching or scanning said ~~computers~~; computers;
- d) sending to a center, through a communication network, a report containing the results of said computer virus search or scanning ~~operation~~ operation;
- e) processing at said center a plurality of reports received from different local computers and allocate said detected computer viruses in geographical ~~areas~~, areas; and
- f) making available information about the most active computer virus at a given time in a series of selectable geographical areas corresponding to said different locations.